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Title

The construction of an imaginary acoustic space

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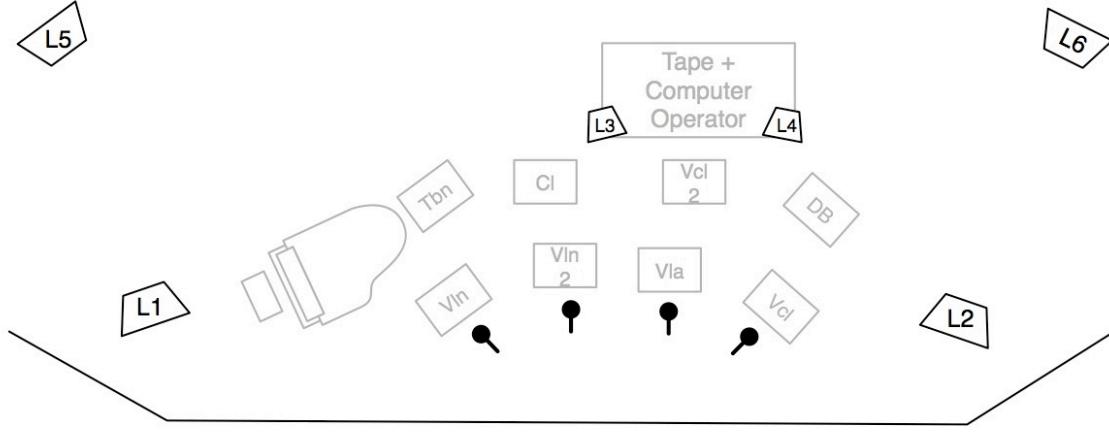
Gabriel Paiuk

The construction of an imaginary acoustic space

for 2 violins, viola, 2 violoncello, double bass, clarinet, trombone, piano and soundtrack operator

2018

Stage Plan and soundtrack operation

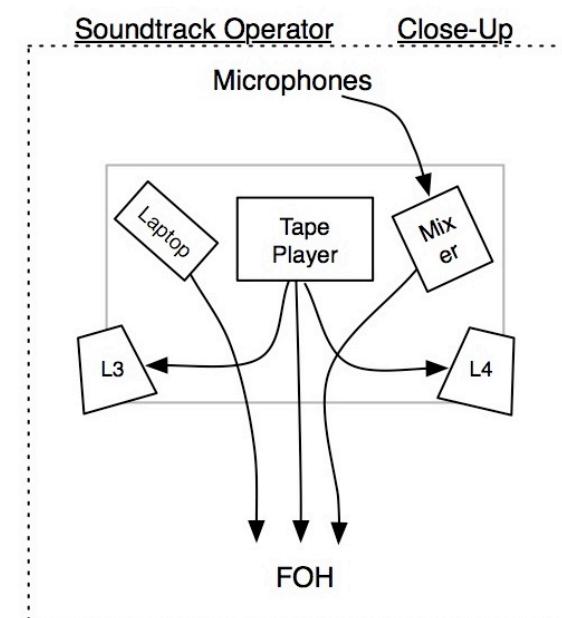


- The soundtrack for "The Construction of an Imaginary Acoustic Space" is comprised of two pre-recorded layers, both of them operated by a musician specifically devoted to this task and located on stage. The *soundtrack operator* controls three devices: a computer (with its corresponding soundcard), an open-reel 1/4 inch tape player, and a small mixing desk that controls the amplification of the four string instruments on the front row of the ensemble. These three devices will be placed on a table on stage (see diagram)

- The computer setup requires a 4-channel output sound card (*) and the Reaper software installed.

(<https://www.reaper.fm/download.php>). The digital soundtrack will be provided in the form of a Reaper session and its corresponding set of audio files. The operator triggers segments of this session through the use of numerical markers, following indications in the score. The first segment will be triggered coincidentally with the beginning of the piece.

The output signal of the sound card will be sent to the Front Of House where it will be



routed to the 4-channel P.A. system (L1, L2, L5 and L6 as seen on the stage diagram and close-up).

(*) L5 and L6 are meant to create a reflected wave-front with a significantly diffused and diverse sound quality than L1 and L2. In the case it is not possible to count with these extra set of channels/loudspeakers, the signal from the soundtrack will be sent only to channels 1-2

- A tape for the open-reel machine is provided. This tape should be set to start playing at the beginning of its playable surface (just immediately after the blue "lead tape"). It will start playing coincidentally with the beginning of the piece.

Throughout the performance the *soundtrack operator* will manually alter the movement of the rolling tape, either by stopping its rotation or by slowing it down. The series of actions required from the operator are indicated in the score using the following graphic signs:



This sign indicates three consecutive steps: 1) the operator applies a gradual force into the left reel until the reel stops rotating. 2) The operator keeps the reel stopped for a brief moment 3) the operator lifts off the pressure of the hand gradually so as to let the reel to rotate freely again. Each of these three steps takes approximately 1 beat of duration.



The operator interferes briefly on the left reel by applying moderate pressure, slowing down for a moment its rotating movement and creating a pitch ondulation. The reel should not come to a complete halt



The operator should stop the reel from rotating. In this case the movement is more abrupt (not gradual) and the reel will remain stopped for a longer period, until the "START" sign indicates that it should be "let" free to rotate again (depending on the functionality of the machine, the "pause" button can be used).

The following video provides an impression of the kind of action intended
https://www.dropbox.com/s/rdtnwazae0oqsj6/GPaiuk_OENM_TapeOperationSample_SHORT.m4v?dl=0

The output of the tape is routed both to the two small monitor loudspeakers placed on the table on stage and to the FOH for reinforcement through L1 and L2 (see diagram).

- The string instruments at the front line of the ensemble will be amplified only on certain brief segments in the piece. The signal from the 4 microphones used to amplify these instruments is sent to the small mixer on the table of the operator and kept on "mute" until the operator has the indication to alternatively "unmute" and "mute" again the signal.

This signal, in the form of a stereo mix, will be sent to the FOH and from there routed to L1 and L2 (see diagrams).

References and Playing techniques

For All

♫ ¼ tone higher or lower

↑ ↓ Microtonal variation, slightly higher or lower, always smaller than a quarter tone

Note: Except on those occasions where *crescendos* and *decrescendos* are applied to the beginning and ending of the sounds, all attacks and endings should be played *tenuto*.

For Strings

Mute symbol. Lay the left hand on all four strings so that they are prevented from vibrating. Result should be a noise-like sound, with very few pitch content when realised in col legno tratto playing.

Scratch

"Scratch" sound. Achieved by added bow pressure. This should result in a dry, controlled, rattling sound. The bow is to be drawn slowly but not haltingly.



Bow actions

C.L.T.

Col Legno Tratto: Draw the wood of the bow across the strings (horizontally).

½ C.L.T.

½ Col Legno Tratto: Draw the bow across the strings holding it at an angle which allows an equal proportion of wood and hair to remain in contact with the string.

Very slow Bowing. Draw the bow at an extremely slow speed. The result should be a fragile, slightly noisier and unstable sound.

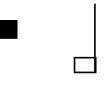
For Clarinet and Trombone

Air sounds

The square notes indicate a toneless sound of breath noise with no pitch at all. The prescribed pitches indicate fingerings resulting in varying degrees of brightness, spectrum, and projection of the "air" sound.

"Air sounds" should by no means be considered as amplifications or representations of the action of breathing. There should not be any additional crescendos or decrescendos at the beginning and ending of these sounds. In this kind of sound production, focus on using a rather small (compressed) oral cavity to be able to generate a considerable amount of air pressure without big wastes of air.

For the clarinet: the letters shown above the beginning of the air sounds indicate the type of oral cavity to be used in each occasion. They do not imply an imitation of the sound of the letter but serve mainly to indicate a variation in tongue position.



Transposition: Clarinet sounds a major second lower than written and Double-Bass sounds an octave lower than written

Total Duration: 19 minutes

Commissioned by Österreichisches Ensemble für Neue Musik

The Construction of an Imaginary Acoustic Space

 $\text{j}=60$

A

Clarinet in B \flat

Trombone

Piano

Violin 1

Violin 2

Viola

Violoncello 1

Violoncello 2

Double Bass

Computer

Tape Player

B♭ Cl.	-	-	-	-	-	-	-	-
Tbn.	-	-	-	-	-	-	-	-
Pno.	-	-	-	-	-	-	-	-
Vln. 1	-	-	-	-	-	-	-	-
Vln. 2	o	o	o	o	o	o	o	o
Vla.	o	o	o	o	o	o	o	o
Vc. 1	o	o	o	o	o	o	o	o
Vc. 2	-	-	-	-	-	-	-	-
D.B.	-	-	-	-	-	-	-	-
Comp	-	-	-	-	-	-	-	-
Tape						(.) (.) (.)		

17

B♭ Cl.

Tbn.

Pno.

Vln. 1

Vln. 2

Vla.

Vc. 1

Vc. 2

D.B.

Comp

Tape

sul pont

sul tasto

mp

33

B♭ Cl.

33

Tbn.

33

Pno.

33

Vln. 1

33

Vln. 2

33

Vla.

33

Vc. 1

33

Vc. 2

33

D.B.

33

Comp

33

Tape

sul pont

sul tasto

2

41

B♭ Cl.

Tbn.

Pno. *mf*

Vln. 1 *gliss.*

Vln. 2

Vla. *gliss.*

Vc. 1 *gliss.*

Vc. 2

D.B.

Comp

Tape STOP

This musical score page contains eight staves of music. From top to bottom, the instruments are: Bass Clarinet (B♭ Cl.), Trombone (Tbn.), Piano (Pno.), Violin 1 (Vln. 1), Violin 2 (Vln. 2), Cello 1 (Vla.), Cello 2 (Vc. 1), Double Bass (D.B.), and a Tape track. The score is numbered 41 at the beginning of each staff. The piano staff includes a dynamic marking 'mf' at the end of the first measure. The violin and cello staves feature 'gliss.' markings above the notes. The tape staff ends with a 'STOP' instruction preceded by a fermata symbol. The bass clarinet, trombone, and double bass staves consist entirely of rests.

57

B♭ Cl.

Tbn.

Pno.

Vln. 1

Vln. 2

Vla.

Vc. 1

Vc. 2

D.B.

Comp

Tape

This musical score page contains eight staves of music for various instruments. The instruments listed on the left are B♭ Clarinet, Trombone, Piano, Violin 1, Violin 2, Cello 1, Cello 2, Double Bass, and Electronic Components/Tape. The score is numbered 57 at the top of each staff. The piano staff includes dynamic markings *p*, *mp*, *mf*, and *mp*. The strings (Violin 1, Violin 2, Cello 1, Cello 2) have specific vibrato instructions: 'Poco Vibrato' and 'Senza Vibrato'. The Double Bass staff has dynamics *pp*, *p*, and *mf*. The Electronic Components/Tape staff is entirely blank.

81

B♭ Cl. *mp*

Tbn. *mp*

Pno. *mp* *mf*

Vln. 1

Vln. 2

Vla.

Vc. 1 *mf*

Vc. 2 *mf*

D.B.

Comp

Tape

STOP

PLAY

This page of the musical score contains eight staves of music for orchestra and tape. The instruments are: B♭ Clarinet, Trombone, Piano, Violin 1, Violin 2, Cello 1, Cello 2, Double Bass, and Tape. The piano part includes dynamic markings *mp* and *mf*, and performance instructions *tasto* and *mf*. The double bass part includes dynamic markings *mf* and *mf*, and performance instructions *mf* and *mf*. The tape part has two sections: one labeled "STOP" and another labeled "PLAY". Various musical symbols such as grace notes, slurs, and dynamic markings are present throughout the score.

D

B♭ Cl. 89 Tbn. 89 Pno. 89 Vln. 1 89 Vln. 2 89 Vla. 89 Vc. 1 89 Vc. 2 89 D.B. 89 Comp 89 Tape 89

pp

pp

mf

f

n. *p*

ordinario

n. *p*

ordinario

p

Small Vibrato

Small Vibrato

p

STOP

97

B♭ Cl.

Tbn.

Pno.

Vln. 1

Vln. 2

Vla.

Vc. 1

Vc. 2

D.B.

Comp

Tape

p

pp

pp

pp

mp

p

mf

mf

pp

C.L.T. Damped

pp

C.L.T. Damped

pp

p

p

p

sul pont

mf

Senza Vibrato

Senza Vibrato

p

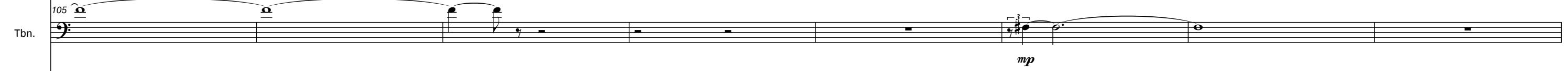
pp

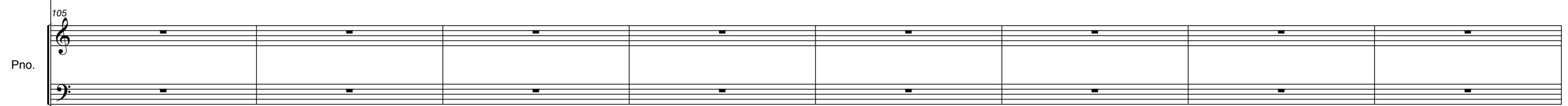
mf

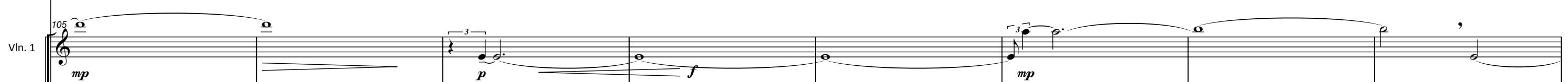
p

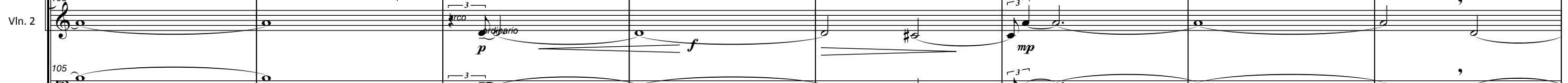
PLAY

B♭ Cl. 105 

Tbn. 105 

Pno. 105 

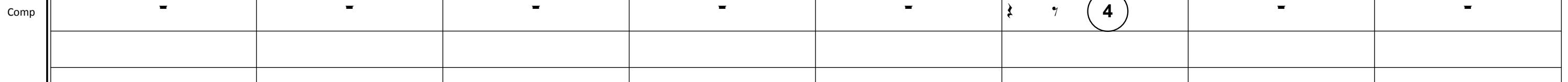
Vln. 1 105 

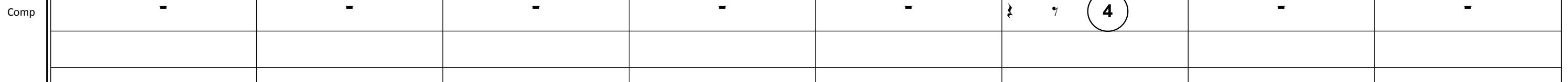
Vln. 2 105 

Vla. 105 

Vc. 1 105 

Vc. 2 105 

D.B. 105 

Comp 105 

Tape 

B♭ Cl. 113 *mp*

Tbn. 113 *mp*

Pno. 113 *mf*

Vln. 1 113 *mp* *mp*

Vln. 2 113 *mp* *mp*

Vla. 113 *mp* *mp*

Vc. 1 113 *mp* *mp*

Vc. 2 113 *mp* *mp*

D.B. 113 *mp* *mp*

Comp.

Tape STOP

This musical score page contains eight staves of music. The top three staves are for brass instruments: B♭ Clarinet, Trombone, and Piano. The middle five staves are for strings: Violin 1, Violin 2, Viola, Cello 1, Cello 2, and Double Bass. The bottom two staves are for electronic media: 'Comp.' (likely computer) and 'Tape'. The score is marked with rehearsal numbers 113 throughout. Dynamic markings include *mp* (mezzo-piano), *mf* (mezzo-forte), and *tut* (tutti). Performance instructions include 'STOP' at the end of the tape staff. The piano staff shows a sustained note with a fermata. The double bass staff includes a dynamic marking 'III' above the staff.

121

B♭ Cl. $\ll p$

Tbn.

121

Pno. mf

Vln. 1

Vln. 2 mf

$> pppp$

Vla. mf

$> pppp$

Vc. 1 mf

Vc. 2 mf

D.B.

121

Comp

Tape

PLAY

129

B♭ Cl.

129

Tbn.

129

Pno.

129

Vln. 1

129

Vln. 2

129

Vla.

129

Vc. 1

129

Vc. 2

129

D.B.

129

Comp

129

Tape

The musical score consists of ten staves. From top to bottom: 1) Bass Clarinet (B♭ Cl.) with a single note at measure 129. 2) Trombone (Tbn.) with a single note at measure 129. 3) Piano (Pno.) with a single note at measure 129, followed by a dynamic marking 'mp' and a performance instruction '5'. 4) Violin 1 (Vln. 1) with sustained notes at measures 129-130. 5) Violin 2 (Vln. 2) with sustained notes at measures 129-130. 6) Cello 1 (Vla.) with sustained notes at measures 129-130. 7) Cello 2 (Vc. 1) with sustained notes at measures 129-130. 8) Double Bass (D.B.) with sustained notes at measures 129-130. 9) A staff labeled 'Comp' containing six empty measures. 10) A staff labeled 'Tape' containing six empty measures. A circled '5' is located in the fifth measure of the Tape staff.

E

137 B♭ Cl. *mf* *mp*

137 Tbn. *mf* *mp*

137 Pno. *mf* *pp*

137 Vln. 1 Poco Vibrato Senza Vibrato *mp*

137 Vln. 2 Poco Vibrato Senza Vibrato *mp*

137 Vla. Poco Vibrato Senza Vibrato Slow Vibrato *mf*

137 Vc. 1 Poco Vibrato Senza Vibrato *mp*

137 Vc. 2 Poco Vibrato Senza Vibrato *mp*

137 D.B. Poco Vibrato Senza Vibrato *mp*

137 Comp

137 Tape

145

B♭ Cl.

Tbn.

Pno.

Vln. 1

Vln. 2

Vla.

Vc. 1

Vc. 2

D.B.

Comp

Tape

[SH]

[RR]

"mf"

"mf"

3

3

Very slow bowing

Vibrato

Senza Vibrato

p

Vibrato

Senza Vibrato

p

Senza Vibrato

Very slow bowing

p

Senza Vibrato

p

gliss.

gliss.

gliss.

gliss.

gliss.

mf

mf

B♭ Cl. 153 [SH] "mf"

Tbn. 153 "mf"

Pno. 153

Vln. 1 153 gliss. 3

Vln. 2 153 gliss. 3

Vla. 153 gliss. 3

Vc. 1 153

Vc. 2 153 gliss. 3

D.B. 153

Comp 153 6

Tape

This page contains musical notation for an orchestra and tape. The score includes parts for B♭ Clarinet, Trombone, Piano, Violin 1, Violin 2, Cello 1, Cello 2, Double Bass, and a tape part. Measure 153 begins with a dynamic marking 'mf' over two measures for the B♭ Clarinet and Trombone. The piano part features sustained notes. The violin parts (Violin 1, Violin 2, and Cello 1) perform glissandos across three octaves. The cello parts (Cello 2 and Double Bass) also have sustained notes. The double bass part consists of sustained notes. The tape part concludes with a circled number '6'. The page ends with a dashed line.

161

B♭ Cl.

Tbn.

Pno.

Vln. 1

Vln. 2

Vla.

Vc. 1

Vc. 2

D.B.

Comp

Tape

This musical score page contains eight staves of music. The top three staves (B♭ Cl., Tbn., Pno.) have measures of rests. The bottom five staves (Vln. 1, Vln. 2, Vla., Vc. 1, Vc. 2) show sustained notes with grace notes and dynamics: 'mf' at measure 161, 'mp' at measure 162, and 'sul tasto' at measure 163. The D.B. staff shows a sustained note with a dynamic 'mf' at measure 162. The Comp staff has rests. The Tape staff features a series of slurs and a 'STOP' instruction at measure 162.

169

B♭ Cl.

Tbn. Hold "Pixie" Mute

Pno. *p*

Vln. 1 sul tasto

Vln. 2

Vla. sul tasto

Vc. 1 sul tasto

Vc. 2

D.B.

Comp

Tape PLAY

B♭ Cl.

Tbn.

Pno.

Vln. 1

Vln. 2

Vla.

Vc. 1

Vc. 2

D.B.

Comp

Tape

This musical score page contains ten staves. The top three staves (B♭ Cl., Tbn., Pno.) show eighth-note patterns. The bottom seven staves (Vln. 1, Vln. 2, Vla., Vc. 1, Vc. 2, D.B., Comp) show sustained notes with dynamic markings *mf*. The piano staff (Pno.) shows a sustained note. The bottom two staves (Tape, Comp) are blank.

185

B♭ Cl.

p

185

Tbn.

PIXIE mute

p

185

Pno.

f

mp

mf

Hold straight Mute

185

Vln. 1

p

molto pont

p

mf

185

Vln. 2

molto pont

p

mf

185

Vla.

molto pont

p

mf

185

Vc. 1

p

molto pont

p

mf

185

Vc. 2

p

molto pont

p

mf

185

D.B.

p

C.L.T.

p

C.L.T.

p

C.L.T.

p

185

Comp

Tape

193

B♭ Cl.

Tbn.

193

Pno.

193 arco
Vln. 1 *mp*

193 Vln. 2 *mp*

193 Vla.

193 arco
Vc. 1 *ordinario*
mp

193 Vc. 2

193 D.B.

193 Comp

193 Tape

201

B♭ Cl.

201

Tbn.

201

Pno. *mp*

201

Vln. 1

201

Vln. 2

201

Vla.

201

Vc. 1

201

Vc. 2

201

D.B.

201

Comp

201

Tape

This page contains two systems of musical notation, each consisting of eight measures. The instruments listed on the left are: Bass Clarinet (B♭ Cl.), Trombone (Tbn.), Piano (Pno.), Violin 1 (Vln. 1), Violin 2 (Vln. 2), Cello 1 (Vc. 1), Double Bass (D.B.), and Tape. Measure numbers 201 are placed above the first measure of each system. Dynamics and performance instructions are included: 'mp' for the piano in the first system, and 'C.L.T.' (likely 'Coda Later Than') above the violins and cellos in the second system. The tape part is present in both systems but has no specific notation other than its instrument name.

209

B♭ Cl.

Tbn.

Pno.

Vln. 1

Vln. 2

Vla.

Vc. 1

Vc. 2

D.B.

Comp

Tape

This musical score page contains two staves of music, labeled 209 and 210. The instruments listed are B♭ Clarinet, Trombone, Piano, Violin 1, Violin 2, Cello, Double Bass, and a combination of Comp and Tape. The score includes dynamic markings such as *p*, *molto pont*, and *arco*. Measure 209 consists of mostly rests with some sustained notes and dynamic markings. Measure 210 begins with sustained notes followed by a section where most instruments play eighth-note patterns. The piano part features a 'Straight Mute' instruction. The strings (Violins, Cello, Double Bass) play eighth-note patterns with dynamics like *p*, *molto pont*, and *arco*. The piano part has a sustained note with a dynamic of *p*.

217 **G**

B♭ Cl.

217 *No Mute*

Tbn.

217 *mf*

Pno.

217 *very slow bowing*

Vln. 1 *mp*

Vln. 2

217 *very slow bowing*

Vla. *3* *ordinario*

Vc. 1

Vc. 2

D.B.

217

Comp 7

217

Tape

225 [SH] [I]
 B♭ Cl. "mf"
 Tbn. "mf"
 Pno. "mf"

225
 Vln. 1
 Vln. 2
 Vla.
 Vc. 1
 Vc. 2
 D.B.

Vibrato Senza Vibrato
 Vibrato Senza Vibrato
 Vibrato Senza Vibrato
 Vibrato Senza Vibrato

sul pont
 C.L.T. ppp
 C.L.T. ppp
 C.L.T. ppp
 C.L.T. ppp
 C.L.T. sul pont ppp

Comp
 Tape ^ mic ON

233

B♭ Cl.

Tbn.

Pno.

Vln. 1

Vln. 2

Vla.

Vc. 1

Vc. 2

D.B.

Comp

v mic OFF

Tape

This page contains ten staves of musical notation. The first three staves (B♭ Clarinet, Trombone, and Piano) each begin with a measure of rests, followed by a dynamic marking of 'ppp' and a measure ending with a '3' above the staff. The remaining seven staves (Violin 1, Violin 2, Viola, Cello 1, Cello 2, Double Bass, and a composite track) feature sustained notes with grace notes and slurs. The composite track staff includes a rectangular box with the text 'v mic OFF'.

248

B♭ Cl.

248

Tbn.

248

Pno.

248

Vln. 1

p

very slow bowing

248

Vln. 2

mp

very slow bowing

248

Vla.

mp

248

Vc. 1

pco

248

Vc. 2

p

248

D.B.

248

Comp

248

Tape

C.L.T.

mf

C.L.T.

C.L.T.

p

C.L.T.

p

C.L.T.

p

mic ON

[H]

B♭ Cl. 255

Tbn. 255

Pno. 255

Vln. 1 255 C.L.T.
Vln. 2 255 mp C.L.T.

Vla. 255 arco

Vc. 1 255 p
Vc. 2 255 arco pp

D.B. 255

Comp 255

Tape

p R
A

5

3

C.L.T.

3

5

mp

v mic OFF

This musical score page contains eight staves of music. The top three staves are for woodwind instruments: B♭ Clarinet, Trombone, and Piano. The middle five staves are for string instruments: Violin 1, Violin 2, Viola, Cello 1, Cello 2, and Double Bass. The bottom two staves are for a composite track and a tape track. The music is numbered 255 throughout. Dynamic markings include *p*, *mp*, *pp*, and *arco*. Performance instructions like 'C.L.T.' (Col Legno Timpani) and 'v mic OFF' are also present. Measure numbers 1 through 8 are indicated by horizontal arrows above the staves.

264

B♭ Cl. *mf*

Tbn. *mf*

Pno.

Vln. 1 *mf*

Vln. 2 *mf*

Vla. *mf*

Vc. 1 *mf*

Vc. 2 *mf*

D.B. *mf*

Comp

Tape

pp

pp

mp

C.L.T.
C.L.T.

3

1/2 C.L.T.

3

1/2 C.L.T.

3

pp

8

273 [SH]

B♭ Cl. "mf"

Tbn. "mf"

Pno.

Vln. 1

Vln. 2

Vla.

Vc. 1

Vc. 2

D.B.

Comp

Tape

This musical score page contains eight staves of music. The top three staves are for woodwind instruments: B♭ Clarinet, Trombone, and Piano. The middle section contains five staves for strings: Violin 1, Violin 2, Cello 1, Cello 2, and Double Bass. The bottom section contains two staves: a composite track (Comp) and a tape track (Tape). Measure 273 begins with a dynamic of 'mf' for the woodwinds and strings. The piano has a sustained note. Measures 274 through 278 show sustained notes with dynamics 'p' and 'mp'. Measure 279 shows sustained notes with dynamics 'mf' and 'p'. Measure 280 concludes with a dynamic of 'p'. Measure 281 is entirely blank. Measure 282 begins with a dynamic of 'p'.

281 [O]
B♭ Cl. "mp"

281
Tbn. "mp"

281
Pno.

281 C.L.T.
Vln. 1 -----> extremely slow bow speed
Vln. 2
281 C.L.T.
Vla. -----> extremely slow bow speed
Vc. 1
281 Vc. 2 C.L.T.
D.B. -----> slow bow speed
281 1/2 C.L.T.
Vln. 1 -----> Regular bow speed
Vln. 2
281 1/2 C.L.T.
Vla. -----> Regular bow speed
Vc. 1
281 1/2 C.L.T.
Vc. 2 -----> Regular bow speed
D.B.
281 Comp
Tape